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Catalytic conversion of high-viscosity oil in situ oxidation conditions

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Abstract

© 2016,International Journal of Pharmacy and Technology. All rights reserved.The steam treatments of wellbore zone with injection into formation of the different heat carriers [1-2] are to be widely applicable production methods of heavy oils. The special attention is paid to development of methods of in situ low-temperature oxidation. The technology involves the injection into petroliferous layer of air or air-oxygen mixture with deliver to the layer of catalyst allowing if necessary the preliminary local heating of layer. The light ends and light-end products,which formed during oxidation,make the oil more movable,and coupled with the released heat and surface-active properties of formed oxidant,reduce the surface oil tension at the boundary of hard phase and it leads to enhanced oil recovery [3-5]. The running of in situ oxidation requires the temperature regulation in layer in the interval of 250-350°C. Because of it,the reaction behavior of low-temperature oxidation of petroleum hydrocarbon becomes possible. The high temperature in a layer may be achieved by using the binary mixtures injection method and thermal-stream technologies. The initiation of the reaction of low-temperature oxidation in the presence of oxygen is also possible with the help of effective homogeneous catalysts. The homogeneous catalysis is one of the most effective methods of incensement of the selectivity of radical-chain reactions because the effective homogeneous catalysts can have an impact on separate,elementary steps of the oxidation process. The metal oxides are usually used as catalysts in oxidation processes. The formation of radicals occurs during interaction of hydrocarbon with oxygen molecule. The experimental results of oxidation of high-viscosity oil,carbonic deposits in air-oxygen environment in the presence of oxidation homogeneous catalysts Tris(acetylacetonato) Iron (III) at temperatures and pressures oriented on the layer conditions are set out. The lowering of density and viscosity of modified oils,growth of content of oil components in its composition,presence of high-molecular n-paraffins were revealed.

Keywords

Acetylacetonate, Catalytic methods of production, Cobalt (III), High-viscosity oil, Low-temperature oxidation